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# COURSE OUTLINE

Department: **COMPUTING AND INFORMATICS** Level: **5** Class: **241** Course Code: **ICTL 241**
Course Name: **ICT TEHNICIAN LEVEL 5** Unit Code: **.....** Unit Name: **PERFORM COMPUTER NETWORKING AND DESIGN MANAGEMENT**
Term: MODULE TWO From: **JANUARY/MARCH**

Date of Preparation**:** **16/01/2026** Date of Revision**:** **20/01/2026** Name of Trainer: **MATHEWS K**

## Relationship to Occupational Standards

This unit addresses the Unit of Competency: Perform Computer Networking

## Unit Description

This unit covers the competencies required to perform network design and management**.** It involves designing computer network, installing computer network, testing computer network and performing computer network maintenance.

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| 1. Design computer network | 1.1 User needs collections<br>1.1.1 Introduction to computer networking<br>1.1.1.1 Definition of Computer Network |

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| | 1.4.4.2 Data and Access point<br>1.4.5 Implement the documented user requirements/needs<br>1.4.6 Fundamental Design Goals<br>1.4.6.1 Scalability<br>1.4.6.2 Availability<br>1.4.6.3 Security<br>1.4.6.4 Manageability |
| 2. Install computer network | 2.1 Safety measures<br>2.1.1 Personal Protective Equipment (PPEs)<br>2.1.1.1 Overall/apron/dust coat<br>2.1.1.2 Antiglare screens<br>2.1.1.3 Dust mask<br>2.1.1.4 Gloves<br>2.1.1.5 Antistatic equipment<br>2.1.1.6 Ergonomics<br>2.1.1.7 First AID kit<br>2.1.2 Cable management<br>2.1.1.8 Proper routing<br>2.1.1.9 Labelling<br>2.1.3 Electrical safety<br>2.1.1.10 Use of insulated tools<br>2.1.1.11 Electrical equipment power ratings<br>2.1.4 Fire safety<br>2.1.1.12 Classes of fires<br>2.1.1.13 Fire extinguishers<br>2.1.4 Emergency procedures<br>2.1.1.14 First AID kit<br>2.1.1.15 Emergency contact<br>2.1.1.16 Contingency measures<br>2.2 Computer network components identification<br>2.2.1 Considerations of network components identification<br>2.2.1.1 Switches/routers |

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| | 2.2.1.2 Transmission media and connectors<br>2.2.1.3 Access points and wireless technology<br>2.2.1.4 Networking software and management tools<br>2.2.1.5 Network security devices<br>2.2.1.6 Servers and storage<br>2.2.2 Network Tools and materials assembly<br>2.2.2.1 Basic network tools<br>2.2.2.1.1 Cable crimpers<br>2.2.2.1.2 Cable strippers<br>2.2.2.1.3 Cutters, Scissors, screw drivers Pliers.<br>2.2.2.1.4 Cable Tie Tools.<br>2.2.2.1.5 Fiber Optic Tools.<br>2.2.2.1.6 Insertion - Extraction Tools.<br>2.2.2.1.7 Manual/Automatic Switch Boxes.<br>2.2.2.1.8 Network Testers.<br>2.2.2.1.9 Punch down Tools.<br>2.2.2.1.10 Tools usage and safety<br>2.2.2.1.11 Driver installers<br>2.2.2.1.12 Multimeter<br>2.2.2.1.13 Tone generator and probe<br>2.2.3 Computer Network materials<br>2.2.3.1 Network cables<br>2.2.3.2 Cable trunking covers<br>2.2.3.3 Connectors<br>2.2.3.4 RJ45 Sockets<br>2.2.3.5 Patch cords<br>2.2.3.6 Cable ties<br>2.3 Computer network set up |

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| | 2.3.1 Network cabling and installation<br>2.3.1.1 Network design layout<br>2.3.1.2 Understanding cabling standards and codes<br>2.3.1.3 Cable termination and installation<br>2.3.1.4 Setting up wireless network devices<br>2.3.1.5 Network set up as per the design<br>2.3.1.6 Application of cable management best practices<br>2.4 Computer network devices configuration<br>2.4.1 Network models (TCP/IP, OSI)<br>2.4.2 Understanding IP Addressing<br>2.4.2.1 Classful IP Addressing<br>2.4.2.2 TCP/IP addressing<br>2.4.2.3 IPV4 and IPV6<br>2.4.2.4 IP Address Classes<br>2.4.2.5 Classless interdomain routing (CIDR-Subnetting)<br>2.4.2.6 Select IP addressing scheme (static vs. dynamic).<br>2.4.3 Basic switch and router configuration<br>2.4.3.1 Initial set up and configuration<br>2.4.3.2 Configuring interfaces and IP addresses<br>2.4.3.3 Setting up routing protocols (EIGRP, RIP and OSPF)<br>2.4.3.4 Configuring VLANs<br>2.4.3.5 Configuring access control lists<br>2.4.3.6 Implementing network address translation (NAT) and port address translation (PAT)<br>2.4.3.7 Implementing port security<br>2.4.3.8 Implementing spanning tree protocol (STP). |

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| | 2.4.3.9 Configuration link aggregation (LACP)<br>2.4.4 Wireless access point configuration<br>2.4.4.1 Setting up access points (APs)<br>2.4.4.2 SSID, DHCP, DNS, SMTP<br>2.4.4.3 Configuring wireless security<br>2.4.4.4 Managing wireless network<br>2.4.4.5 Network Security configuration<br>2.4.4.6 Definition of Network privileges<br>2.4.4.7 Implement firewall and security policies<br>2.4.4.8 Types of Privileged Accounts<br>2.4.4.9 Network privileges are allocated according to the network configuration.<br>2.5 Computer network documentation<br>2.5.1 Define network documentation<br>2.5.2 Importance of network documentation<br>2.5.3 Types of network documentations<br>2.5.3.1 Physical, Logical and configuration<br>2.6 Computer network components disposal<br>2.6.1 Identify computer network waste<br>2.6.2 Classify computer network waste<br>2.6.2.1 E- waste<br>2.6.2.2 Hazards<br>2.6.2.3 Disposal methods<br>2.6.3 Legal regulation and compliance on waste disposal<br>2.6.3.1 Waste management act, 2022<br>2.6.3.2 EMCA act, 2015 on waste management<br>2.6.4 Disposal methods<br>2.6.4.1 The public procurement and assets disposal act, 2015 |

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| 3. Test computer network | 3.1 Introduction to network testing<br>3.1.1 Importance of network testing<br>3.1.2 Network testing tools and equipment<br>2.6.4.2 Clamp meter<br>2.6.4.3 Voltmeter<br>2.6.4.4 Cable tester<br>2.6.4.5 Signal tester<br>2.6.4.6 Ping<br>2.6.4.7 Traceroute<br>2.6.4.8 Wireshark<br>3.2 Network components testing<br>3.2.1 Types of network testing<br>2.6.4.9 Performance<br>2.6.4.10 Functional<br>2.6.4.11 Security<br>3.2.2 Network testing procedures and standards<br>3.3 Network testing report<br>3.3.1 Importance of generating network test report<br>3.3.2 Components of a network test report<br>3.3.3 Presenting network test reports<br>2.6.4.12Reports presentation techniques<br>2.6.4.13Preparing interactive presentations |
| 4. Perform computer network maintenance. | 4.1 Computer network maintenance schedule<br>4.1.1 Importance of network maintenance<br>4.1.2 Preparation of maintenance schedule<br>4.1.3 Network troubleshooting process<br>4.1.4 Network troubleshooting techniques<br>4.2 Computer network Monitoring<br>4.2.1 Monitoring tools<br>4.2.1.1 Ping<br>4.2.1.2 Tracert |

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| | 4.2.1.3 NSLookup<br>4.2.1.4 Ipconfig<br>4.2.1.5 Speed test<br>4.2.1.6 Traceroute<br>4.2.1.7 Wireshark<br>4.2.2 Setting and configuring monitoring tools<br>4.2.3 Analysing network performance data<br>4.3 Computer network optimization<br>4.3.1 Network optimization techniques<br>4.3.2 Implementing quality of service (QOS)<br>4.4 Computer network maintenance report<br>4.4.1 Importance of generating network maintenance report<br>4.4.2 Components of a network maintenance report<br>4.4.3 Preparation of network maintenance report |